

machine element; and

a sensor on ~~the interior surface of the machine element and a~~  
wall parallel to the first wall positioned to detect intensity of  
light within the machine element wherein the intensity of light  
corresponds to a position of the head element within the machine  
element at any point between the first end and the second end.

2. (Original) The apparatus of Claim 1 further comprising:

a coating on the shaft element.

3. (Previously amended) The apparatus of Claim 1 further  
comprising:

a coating on the interior surface of the machine element.

4. (Original) The apparatus of Claim 1 further comprising:

a seal disposed around the shaft element.

5. (Previously amended) The apparatus of Claim 1 further  
comprising:

a second sensor attached to the first wall.

6. (Previously amended) The apparatus of Claim 1 further  
comprising:

a first brush positioned at the second wall of the machine  
element.

7. (Original) The apparatus of Claim 6 wherein the first brush  
is constructed from wire.

8. (Previously amended) The apparatus of Claim 1 further  
comprising:

a second light source attached to the machine element at the first wall of the machine element.

9. (Previously amended) The apparatus of Claim 1 wherein the light source is attached at the second wall.

10. (Previously amended) The apparatus of Claim 1 further comprising:

a coating on the head element.

11. (Currently amended) An apparatus for cleaning a machine component, the apparatus comprising:

a machine element having a body defining an interior wherein the body has ~~an interior surface and~~ a length defined between a first end and a second end wherein the first end has ~~an interior~~ a wall having an opening and ~~an exterior wall opposite the interior wall~~ further wherein the wall has a surface which is exterior to the machine element;

a shaft element ~~movable~~ which is moved within the machine element wherein the shaft element extends through the opening in the wall;

a head element within the interior of the machine element wherein the head element is attached to the shaft element ~~and adjacent to the interior surface of the machine element;~~ and

a first brush positioned on the ~~exterior~~ surface of the wall ~~of the first end of the body~~ wherein the first brush is exterior to the machine element and contacts the shaft element.

12. (Original) The apparatus of Claim 11 further comprising:

a seal disposed around the shaft.

13. (Original) The apparatus of Claim 11 further comprising:

a coating on the shaft element.

14. (Currently amended) The apparatus of Claim 11 further comprising:

a second brush positioned on the exterior to the body of the machine element surface of the wall.

15. (Original) The apparatus of Claim 11 further comprising:

a light source attached to the machine element.

16. (Original) The apparatus of Claim 11 further comprising:

a sensor positioned to receive reflected light within the machine element.

17. (Currently amended) A method for measuring displacement of a machine element, the method comprising the steps of:

providing a machine element having a body defining an interior wherein the body has an interior surface and a length defined between a first end and a second end;

providing a shaft element ~~capable of movement~~ which moves within the machine element wherein movement of the shaft element towards the first end causes movement of the shaft element away from the second end;

attaching a head element to the shaft element;

positioning the head element adjacent to the interior surface

of the machine element;

attaching a light source to the machine element ~~on a~~ at the first end ~~side of the head element;~~

attaching a sensor to the machine element at the second end ~~on a second side of the head element wherein the first side and the second side are not the same; and~~

measuring intensity of light within the machine element from reflected light detected by the sensor.

18. (Original) The method of Claim 17 further comprising the steps of:

moving the shaft element; and

producing an output signal as the shaft element moves within the machine element.

19. (Previously amended) The method of Claim 18 further comprising the steps of:

providing a processing unit that receives the output signal; and displaying the output signal.

20. (Previously amended) The method of Claim 17 further comprising the step of:

positioning a seal within the machine element.

21. (Original) The method of Claim 17 further comprising the step of:

attaching a first brush to the machine element.

22. (Previously amended) The method of Claim 21 further comprising

the step of:

attaching a second brush to the machine element.